

**REMARKS/ARGUMENTS**

The Office Action mailed October 1, 2008, has been received and reviewed. Claims 1-5, 7-16, 18-67, 69-90, and 94-119 are currently pending in the application. Claims 1-5, 7-16, 18-28, 31-65, 69-90, and 94-199 stand rejected. Claims 29, 30, 66, and 67 are withdrawn from consideration. Applicants have amended claims 1, 57-65, 69-74, 87-90, 101-106, and 116-118, and respectfully request reconsideration of the application in light of the amendments and arguments presented herein.

Independent claim 1 has been amended to recite that the non-azide, non-azole composition is formulated to pyrotechnically produce no sodium chloride and an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide. While Applicants acknowledge that the as-filed specification does not explicitly describe that combustion of the non-azide, non-azole composition does not produce sodium chloride, a person of ordinary skill in the art would understand that, based on the ingredients of the composition described in the as-filed specification at least at paragraphs [0025]-[0035], no sodium chloride is produced. Independent claims 1, 57, and 116-118 have been amended to improve the clarity thereof. Dependent claims 58-65, 69-74, 87-90, and 101-106, have been amended to improve antecedent basis.

As an initial matter, Applicants note that the Examiner has failed to address or respond to the specific arguments set forth in Applicants' Pre-Appeal Brief filed on August 18, 2008, and Amendment filed on March 13, 2008, other than to merely state that "Applicant[s]' arguments have been considered but are moot in view of the new ground(s) or rejection." Office Action of October 1, 2008, p. 2. Applicants submit that such an approach to examination is clearly contrary to established examination guidelines because it encourages piecemeal examination. Particularly, Applicants note that "[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." MPEP § 707.07(f) (emphasis added). In order for Applicants to continue to advance prosecution, Applicants respectfully request that the Examiner provide specific responses to the arguments presented herein.

### 35 U.S.C. § 103(a) Obviousness Rejections

#### Obviousness Rejection Based on U.S. Patent No. 5,449,041 to Galbraith in view of U.S. Patent No. 6,143,104 to Blomquist

Claims 1-5, 7-14, 18, 22-25, 57-65, 69, 72-75, 77, 78, 96-106, and 115-119 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,449,041 to Galbraith (“Galbraith”) in view of U.S. Patent No. 6,143,104 to Blomquist (“Blomquist”). Applicants respectfully traverse this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Additionally, the Examiner must determine whether there is “an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-1741, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Further, rejections on obviousness grounds “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* at 1741, quoting *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006). Finally, to establish a *prima facie* case of obviousness, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant’s disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); MPEP § 2144. Underlying the obvious determination is the fact that statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

Galbraith teaches a method and apparatus for suppressing a fire. Galbraith at column 1, lines 6-10. A solid propellant in the apparatus is ignited to produce a first gas that includes carbon dioxide, nitrogen, and water vapor. *Id.* at column 3, lines 3-5 and lines 64-67. The solid propellant is an azide-based or an azole-based mixture. *Id.* at column 4, line 23-column 5, line 11. The first gas is directed from the apparatus to suppress the fire. *Id.* at column 3, lines 5-7 and column 7, lines 40-43.

Blomquist teaches a gas generating composition that includes a non-azide organic fuel, an oxidizer, and an ammonium salt coolant. Blomquist at the Abstract and column 2, lines 28-31. During combustion, an anion of the ammonium salt coolant reacts with an alkali metal or alkaline earth metal ion of the oxidizer to produce a reaction product that includes sodium chloride. *Id.* at column 3, lines 6-12, Tables 1-3, and column 5, lines 53-57. The reaction product reduces the combustion temperature of the gas generating composition. *Id.* at column 3, lines 15-18. The reaction product includes carbon dioxide but is substantially free of carbon monoxide. *Id.* at column 3, lines 35-39. The ammonium salt coolant is a critical component of the gas generating composition and includes an ammonium halide, an ammonium sulfate, or an ammonium sulfamate. *Id.* at column 2, line 66 through column 3, line 3. Calculated combustion results (water, nitrogen, carbon dioxide, sodium chloride, sodium aluminate, and sodium silicate) are provided in Tables 1-3. *Id.* at column 4, line 1 through column 5, line 29.

The obviousness rejection of claims 1-5, 7-14, 18, 22-25, 57-65, 69, 72-75, 77, 78, 96-106, and 115-119 is improper because the applied references do not teach or suggest all of the claim limitations. In addition, there is no reason in the applied references, common knowledge, or the nature of the problem itself to combine the applied references.

The applied references do not teach or suggest the limitation in claim 1 of “the at least one gas generant comprising a non-azide, non-azole composition formulated to pyrotechnically produce no sodium chloride and an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide.” Instead, the solid propellant of Galbraith is an azide-based or an azole-based solid propellant. Blomquist also does not teach or suggest this limitation because the gas generating composition includes an ammonium salt coolant as a critical component, which produces sodium chloride upon combustion. In addition, contrary to the Examiner’s assertion, the gas generating composition of Blomquist is not formulated to pyrotechnically produce an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide. Of the gas generating compositions described in Tables 1-3 of Blomquist (column 4, lines 1-67 and column 5, lines 1-29), the dicyandiamide-based formulations (Examples 1-6 of Table 1) and the nitroguanidine-

based formulations (Examples 13-18 of Table 3) are non-azide, non-azole compositions. When combusted, these formulations produce between 0.22 moles and 0.42 moles of carbon dioxide, as shown by the combustion results in Tables 1 and 3 of Blomquist. Dividing the moles of carbon dioxide produced (from Tables 1 and 3 of Blomquist) by the total moles of gaseous products produced (moles of water, nitrogen, and carbon dioxide, from Tables 1 and 3 of Blomquist), and multiplying this number by 100 provides the percent by volume of carbon dioxide produced upon combustion of each formulation, which is shown in the last row of the table below. The percent by volume of carbon dioxide produced for each non-azide, non-azole formulation of Blomquist is substantially higher than the Immediately Harmful to Life or Health (IDLH) value of carbon dioxide, which is described at paragraphs [0004] and [0021] of the as-filed specification as being a concentration of 4% by volume.

Formulation from Blomquist	1	2	3	4	5	6	13	14	15	16	17	18
Water (moles)	0.677	1.53	1.39	1.25	1.33	1.14	1.15	1.57	1.44	1.30	1.39	1.21
Nitrogen (moles)	1.11	0.87	0.86	0.85	0.88	0.88	1.39	1.05	1.06	1.08	1.11	1.16
Carbon dioxide (moles)	0.29	0.22	0.25	0.29	0.29	0.35	0.36	0.26	0.31	0.35	0.34	0.42
Total moles	2.08	2.62	2.50	2.39	2.50	2.37	2.90	2.88	2.81	2.73	2.84	2.79
% carbon dioxide by volume	14	8	10	12	12	15	12	9	11	13	12	15

Furthermore, while Blomquist provides combustion results in Tables 1-3, Blomquist does not teach or suggest relative amounts of the water, nitrogen, and carbon dioxide directed from the apparatus and into the environment. As such, Galbraith and Blomquist do not teach or suggest pyrotechnically producing an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide.

The applied references also do not teach or suggest the limitation in claim 1 of “the fire suppression system configured to dispel, at an exit thereof, the inert gas mixture to provide a dispelled inert gas mixture into a space, the dispelled inert gas mixture comprising carbon

dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant.” While Galbraith teaches that carbon dioxide, nitrogen, and water vapor are produced upon ignition of the solid propellant and are directed from the apparatus, Galbraith does not describe relative amounts of the produced gases or relative amounts of the gases that are directed from the apparatus and into the environment. As such, Galbraith does not teach or suggest this limitation. Blomquist also does not teach or suggest this limitation because while Blomquist provides combustion results in Tables 1-3, Blomquist does not teach or suggest relative amounts of the water, nitrogen, and carbon dioxide directed from an apparatus and into the environment. Rather, the combustion results in Blomquist are calculated results, as described at column 3, lines 58-59 and Tables 1-3. Since Blomquist does not teach or suggest an apparatus from which an inert gas mixture is dispelled, Blomquist does not teach or suggest this limitation.

There is also no reason in the applied references, common knowledge, or the nature of the problem itself to combine the applied references. The Examiner states that “it would have been obvious . . . to have modified the device of Galbraith et al. by using a non-azide composition to produce an inert gas mixture having the recited carbon dioxide concentration as has already been taught by Blomquist.” Office Action of October 1, 2008, p. 3. However, even if the applied references were combined in the manner asserted by the Examiner, the claimed invention would not be produced because, as described above, Blomquist does not teach or suggest the carbon dioxide concentration recited in claim 1.

The Examiner also states that “[m]aking the concentration less than or equal to the Immediately Harmful to Life or Health concentration would have been an obvious safety and health requirement.” *Id.* However, the Examiner has provided nothing in the applied references, the common knowledge, or the nature of the problem itself in support of this conclusory assertion.

The applied references do not teach or suggest the limitation in claim 57 of “dispersing the inert gas mixture into a space to extinguish a fire, the dispersed inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration produced by ignition of the at least one gas generant such that the space comprises carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide.”

The applied references do not teach or suggest this limitation for substantially the same reasons as discussed above for claim 1. While Galbraith teaches that carbon dioxide, nitrogen, and water vapor are produced upon ignition of the solid propellant and are directed from the apparatus, Galbraith does not describe relative amounts of the produced gases or relative amounts of the gases that are directed from the apparatus and into the environment. As such, Galbraith does not teach or suggest this limitation. Blomquist does not teach or suggest this limitation because combustion of the non-azide and non-azole formulations of Blomquist produces carbon dioxide at a concentration substantially higher than the Immediately Harmful to Life or Health (IDLH) value.

The applied references do not teach or suggest the limitation in claim 116 of “the fire suppression system configured to dispel, at an exit thereof, the first gas mixture and a second gas mixture comprising carbon dioxide into a space to provide carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide in the space.” While Galbraith teaches that carbon dioxide, nitrogen, and water vapor are produced upon ignition of the solid propellant and are directed from the apparatus, Galbraith does not describe relative amounts of the produced gases or relative amounts of the gases that are directed from the apparatus and into the environment. Blomquist also does not teach or suggest this limitation because combustion of the non-azide and non-azole formulations of Blomquist produces carbon dioxide at a concentration substantially higher than the Immediately Harmful to Life or Health (IDLH) value. Furthermore, while Blomquist provides combustion results in Tables 1-3, Blomquist also does not teach or suggest relative amounts of the water, nitrogen, and carbon dioxide directed from an apparatus and into the environment.

The applied references do not teach or suggest the limitations in claim 117 of “a chamber and at least one non-azide, non-azole gas generant housed therein, the at least one non-azide, non-azole gas generant formulated to pyrotechnically produce an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide.” Galbraith and Blomquist do not teach or suggest this limitation for substantially the same reasons as discussed above for claim 1. Galbraith and Blomquist also do not teach or suggest the limitation of “the fire suppression system configured

to dispel, at an exit thereof, at least a portion of the inert gas mixture, the dispelled inert gas mixture comprising carbon dioxide in a concentration equal to the concentration pyrotechnically produced by the at least one non-azide, non-azole gas generant” for substantially the same reasons as discussed above for claim 1.

The applied references do not teach or suggest the limitation in claim 118 of “the fire suppression system configured to dispel, at an exit thereof, the inert gas mixture as pyrotechnically produced into a space, the space comprising carbon dioxide at less than approximately 4% by volume.” Galbraith and Blomquist do not teach or suggest this limitation for substantially the same reasons as discussed above for claim 1.

Since the applied references do not teach or suggest all of the limitations of independent claims 1, 57, and 116-118, the obviousness rejection is improper and should be withdrawn.

Dependent claims 2-5, 7-14, 18, 22-25, 58-65, 69, 72-75, 77, 78, 96-106, and 115-119 are allowable, *inter alia*, as depending from an allowable base claim.

Claim 7 is further allowable because the applied references do not teach or suggest that the at least one gas generant is formulated to produce less than 1 percent of an original weight of the at least one gas generant in particulates or smoke.

Claim 23 is further allowable because the applied references do not teach or suggest that the fire suppression system further comprises at least one diffuser plate to disperse the inert gas mixture.

Claim 24 is further allowable because the applied references do not disclose that the at least one diffuser plate is configured and positioned to diffuse the inert gas mixture into a heat management system.

Claim 25 is further allowable because the applied references do not teach or suggest that the at least one diffuser plate is configured and positioned to disperse the inert gas mixture exiting from the fire suppression system.

Obviousness Rejection Based on Galbraith in view of Blomquist and Further in View of U.S. Patent No. 5,538,568 to Taylor *et al.* and U.S. Patent No. 5,882,036 to Moore *et al.*

Claims 15, 70, 79, 80, 94 and 95 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Blomquist, and further in view of U.S. Patent No. 5,538,568 to Taylor *et al.* (“Taylor”) and U.S. Patent No. 5,882,036 to Moore *et al.* (“Moore”). Applicants respectfully traverse this rejection, as hereinafter set forth.

The teachings of Taylor and Moore are summarized on p. 21 of the January 11, 2007 Response.

The nonobviousness of independent claims 1 and 57 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. See In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), see also MPEP § 2143.03.

As such, dependent claims 15, 70, 79, 80, 94, and 95 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in view of Blomquist and Further in View of Taylor and U.S. Patent No. 6,481,746 to Hinshaw *et al.*

Claims 16, 71, and 81-90 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Blomquist, and further in view of Taylor and U.S. Patent No. 6,481,746 to Hinshaw *et al.* (“Hinshaw”). Applicants respectfully traverse this rejection, as hereinafter set forth.

Hinshaw teaches a gas generating composition that includes a metal complex, such as HACN and polyacrylamide. Hinshaw at column 3, lines 51-59 and column 7, line 62 through column 8, line 7. Upon combustion, the gas generating composition produces nitrogen and water vapor. *Id.* at column 5, lines 1-6. Carbon dioxide or carbon monoxide is also produced if a carbon-containing ingredient, such as a carbon-containing binder, co-oxidizer, common ligand, or oxidizing anion, is present. *Id.*

The nonobviousness of independent claims 1 and 57 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the



independent claim from which it depends is obvious. See In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03.

As such, dependent claims 16, 71, and 81-90 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on U.S. Patent No. 5,449,041 to Galbraith in view of U.S. Patent No. 6,143,104 to Blomquist and Further in View of U.S. Patent No. 5,739,460 to Knowlton *et al.*

Claims 19-21 and 76 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Blomquist, and further in view of U.S. Patent No. 5,739,460 to Knowlton *et al.* (“Knowlton”). Applicants respectfully traverse this rejection, as hereinafter set forth.

The teachings of Knowlton are summarized on p. 24 of the January 11, 2007 Response.

The nonobviousness of independent claims 1 and 57 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. See In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03.

As such, dependent claims 19-21 and 76 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in view of Blomquist and Further in View of U.S. Patent No. 6,116,348 to Drakin

Claims 26-28, 31-45, 48, 49, and 53-56 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Blomquist, and further in view of U.S. Patent No. 6,116,348 to Drakin (“Drakin”). Applicants respectfully traverse this rejection, as hereinafter set forth.

The nonobviousness of independent claim 1 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. See In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03.

As such, dependent claims 26-28, 31-45, 48, 49, and 53-56 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in view of Blomquist and Drakin and Further in View of Taylor and Moore

Claim 46 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Blomquist and Drakin, and further in view of Taylor and Moore. Applicants respectfully traverse this rejection, as hereinafter set forth.

The nonobviousness of independent claim 1 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03.

As such, dependent claim 46 is allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in view of Blomquist and Drakin and Further in View of Taylor and Hinshaw

Claim 47 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Blomquist and Drakin, and further in view of Taylor and Hinshaw. Applicants respectfully traverse this rejection, as hereinafter set forth.

The nonobviousness of independent claim 1 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03.

As such, dependent claim 47 is allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in view of Blomquist and Drakin and Further in View of Knowlton

Claims 50-52 and 76 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Blomquist and Drakin, and further in view of Knowlton. Applicants respectfully traverse this rejection, as hereinafter set forth.

The nonobviousness of independent claims 1 and 57 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. See In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), see also MPEP § 2143.03.

As such, dependent claims 50-52 and 76 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in view of Blomquist and Further in View of Hinshaw

Claims 107-114 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Blomquist, and further in view of Hinshaw. Applicants respectfully traverse this rejection, as hereinafter set forth.

The obviousness rejection of claims 107-114 is improper because the applied references do not teach or suggest all of the claim limitations. In addition, there is no reason in the applied references, common knowledge, or the nature of the problem itself to combine the applied references.

The applied references do not teach or suggest the limitation in claim 107 of “the fire suppression system configured to dispense, at an exit thereof, the inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant.” Galbraith and Blomquist do not teach or suggest this limitation for substantially the same reasons as discussed above for claim 1. Hinshaw does not cure this deficiency in Galbraith and Blomquist because nothing in Hinshaw teaches a fire suppression system that is configured to dispense an inert gas mixture comprising carbon dioxide

in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant.

The Examiner states “[i]t would have been obvious . . . to have made the gas generant of Galbraith and Blomquist comprising a combination of the elements as taught by Taylor et al. and Hinshaw et al. since Taylor et al. and Hinshaw et al. teach such elements for forming a gas generant are know[n] in the art and the combination of these elements would properly form a gas generant.” Office Action of October 1, 2008, p. 7. However, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. § 2143.01 (emphasis in original). Since nothing in Galbraith, Blomquist, Taylor, or Hinshaw suggests the desirability of the combination, the Examiner’s reason for combining the applied references appears to be a hindsight attempt to gather elements for bringing them together with the benefit of Applicants’ disclosure.

Dependent claims 108-114 are allowable, *inter alia*, as depending from an allowable base claim.

### ENTRY OF AMENDMENTS

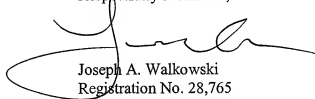
The amendments to claims 1, 57-65, 69-74, 87-90, 101-106, and 116-118 should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add new matter to the application.

Applicants consider claims 1, 57, and 107 to be generic, and note that upon allowance of a generic claim, claims depending therefrom in a non-elected species would also be allowable.

### CONCLUSION

Claims 1-5, 7-16, 18-67, 69-90, and 94-119 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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